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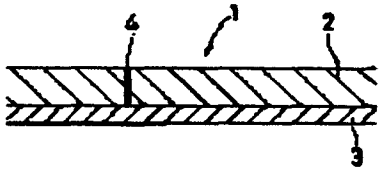
(54) PACKAGING MATERIAL WHICH CAN RELEASE INTERNAL PRESSURE

(57)Abstract:
PROBLEM TO BE SOLVED: To enable internal pressure to be released at the time of heating by a microwave oven or the like by providing a breaking layer of specific thickness and relatively weak fracture strength on a heat seal layer, fusing this to a part of a base material or the heat seal layer, and providing an internal pressure release port reaching the breaking layer.
SOLUTION: In the packaging material 1 comprising a heat seal layer 3 laminated on a heat-resistant material 2, an internal opening port 4 with an end opened on an external face of the base material 2 and the other end reaching at least the heat seal layer 3 is provided, and a braking layer with a fusing interface approximately coinciding with an end of the internal opening port 4 and made of thermoplastic synthetic resin having relatively weak fracture strength as thick as 5 to 30 μm is provided on the heat seal layer 3. The heat seal layer 3 may comprise an external breaking layer and an internal resin layer fused thereto, while the internal pressure opening port 4 may be from the base material 2 through the internal resin layer. The external breaking layer is preferably formed of one of low density polyethylene, ethylene-vinyl acetate copolymer, ionomer or the like.



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CLAIMS

[Claim(s)]

[Claim 1] The packing material to which a weld interface is characterized by for the end having been wide opened by the superficies of the aforementioned base material, having prepared the internal pressure opening mouth with which the other end reaches the aforementioned heat-sealing layer at least in the packing material which carried out the laminating of the heat-sealing layer to the heat-resistant base material, and the thickness to superficies preparing the fracture layer which is 5-30 micrometers in the aforementioned heat-sealing layer almost in accordance with the other end of this internal pressure opening mouth and in which internal pressure opening is possible.

[Claim 2] The packing material which was indicated by the claim 1 characterized by consisting of two-layer [of the inside resin layer by which the aforementioned heat-sealing layer was welded to an outside fracture layer and this], and the aforementioned internal pressure opening mouth **(ing) from the aforementioned base material to an outside fracture layer mostly and in which internal pressure opening is possible.

[Claim 3] the aforementioned fracture layer -- a low density polyethylene and a line -- the packing material which consists of a low density polyethylene, an ethylene vinylacetate copolymer, polypropylene, an ethylene-acrylic-acid copolymer, or the ionomers and in which internal pressure opening according to claim 1 or 2 is possible

[Claim 4] the aforementioned inside resin layer -- a low density polyethylene and a line -- the packing material which are a low density polyethylene, an ethylene vinylacetate copolymer, polypropylene, an ethylene-acrylic-acid copolymer, or the ionomers and in which internal pressure opening according to claim 1 or 2 is possible

[Claim 5] The packing material which the aforementioned internal pressure opening mouth cuts and consists of an eye or a stoma and in which internal pressure opening according to claim 1 to 4 is possible.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] When this invention heats a packing object with a microwave oven etc., it relates to the packing material which enabled it to open internal pressure automatically.
[0002]
[Description of the Prior Art] If freezing, a refrigerated food, etc. are heated with a microwave oven still in the state in the state where seal packing was carried out, the moisture contained in food will become a steam, internal pressure will go abruptly up, and ******** will explode at last. Therefore, food is picked out from a packing object and it removes to another heat-resistant container, and it wraps in a wrap film, or the lid is put and heated. This is time-consuming operation which lacks in convenience.
[0003] Then, a packing object is formed with a heat-resistant film or a sheet, and how to cut a packing object with scissors etc. and to prepare opening at the time of heating is considered. However, this not only also requires time and effort, but there may be no convenience like scissors close by. On the other hand, opening some packing objects wide beforehand in a manufacture stage is performed, and the contents which sealing performance is spoiled and are packed will also be limited. Therefore, there is a method of closing with the label the internal pressure opening mouth prepared beforehand, exfoliating a label in the case of heating, and opening the open mouth wide. However, this also has the problem which the excessive process closed with a label joins.
[0004] Therefore, the superposition tape which prepares the weak portion of a bond strength in the heat seal section of a packing object, or a bond strength is weak and tends to divide into two is inserted, and when internal pressure increases by heating, there are some which the weak portion of a bond strength exfoliates automatically, and opening is formed, and opened internal pressure. However, since the weak portion of a bond strength is in the heat-sealing section even if partial, strong sealing performance cannot be expected by homogeneity, but a pouch like a bag body is formed further beforehand, and it is necessary to take the process which fills this up with contents, and is not fit for packing and pyro packing which performs restoration continuously simultaneously. And the method of inserting a tape has the problem which becomes structurally complicated and leads to the increase of cost.
[0005] In addition, what carried out the laminating of the low melting point resin film to the base material which prepared the air hole as heat seal material, considered as lid material, and carried out the heat seal of this to the container is known. It will liquefy, if a low melting point resin film reaches the melting point by heating, and it is pushed up to an air hole portion by internal pressure, and the penetrated air hole is formed. However, when a low melting point film fuses, seal intensity becomes weak and there is a problem that sealing performance is spoiled. Moreover, since it is located in the innermost layer which touches contents directly, when it flies, a low melting point film will be attached, and it adheres to contents or it also has a possibility that the additive of a low melting point film may melt and the scent and taste of broth contents may be spoiled.
[0006] moreover, the above -- also in which internal pressure opening method, there is a problem that control of the heating temperature at the time of internal pressure opening is very difficult
[0007]
[Problem(s) to be Solved by the Invention] Then, the technical problem of this invention can be heated with a microwave oven, with food packed, and has neither rupture nor scattering of contents, and the temperature control of internal pressure opening can also be easy, contents can be packed airtightly completely without a non-seal portion, it can respond to any packing gestalt of pyro packing or pouch packing, and productivity is offering a high packing material cheap also in cost.
[0008]
[Means for Solving the Problem] In the packing material to which this invention carried out the laminating of the heat-sealing layer to the heat-resistant base material in order to solve the above-mentioned technical problem An end is wide opened by the superficies of the aforementioned base material, and the internal pressure opening mouth with which the

other end reaches the aforementioned heat-sealing layer at least is prepared. A weld interface is characterized by the thickness to superficies preparing the fracture layer which consists of thermoplastic synthetic resin with the comparatively weak breaking strength which is 5 micrometers - 30 micrometers in the aforementioned heat-sealing layer almost in accordance with the other end of this internal pressure opening mouth.
[0009] It can consist of the inside resin layer by which the aforementioned heat-sealing layer was welded to an outside fracture layer and this, and the aforementioned internal pressure opening mouth can be made to penetrate from the aforementioned base material to an inside resin layer.
[0010] the aforementioned outside fracture layer -- a low density polyethylene and a line -- it is desirable to form by a low density polyethylene, an ethylene vinylacetate copolymer, polypropylene, an ethylene-acrylic-acid copolymer, or the ionomers
[0011] Moreover, as for the aforementioned inside resin layer, it is desirable to form by thermoplastic synthetic resin homogeneous as an outside fracture layer.
[0012] The aforementioned internal pressure opening mouth consists of an end eye or a stoma.
[0013]
[Function] The aforementioned fracture layer consists of a resin layer with comparatively weak breaking strength, and except the portion of an internal pressure opening mouth, since it is welding to a part of base material or heat-sealing layer, a weak point portion, a part for i.e., the fracture layer corresponding to an internal pressure opening mouth, fractures it by internal pressure elevation.
[0014]
[The gestalt of operation] Hereafter, the operation gestalt of this invention is explained based on an accompanying drawing.

[0015] Drawing 1 shows the example from which the heat-sealing layer itself is a fracture layer. Like illustration, a packing material 1 consists of the heat-resistant base material 2 and the heat-sealing layer 3, and the internal pressure opening mouth 4 which penetrates a base material 2 is formed in the base material 2. The end eyes 4b, 4c, and 4d of the shape of "+" besides end eye 4a of linear "[-]" configuration as shown in drawing 2 , "x", and a "U" typeface are sufficient as the internal pressure opening mouth 4, or stoma 4e is sufficient as it. The configuration of stoma 4e may not be restricted circularly [illustration], but the anomaly of a polygon and others is sufficient as it. Although especially a limit does not have the size of an end eye or a stoma, it is about 2-5mm in the major axis of about 1-15mm and a stoma by the length of an end eye. Of course, you may prepare more than one.
[0016] As the aforementioned base material 2 with thermal resistance, a synthetic-resin film with thermal resistance is common, in order to use with a microwave oven, especially, high thermal resistance is not required but a simple substance or complex, such as biaxial extension polypropylene, 1 shaft extension high density polyethylene, biaxial extension polyester, and a biaxial extension polyamide, are used. In addition, paper and a metallic foil may be used and it will be necessary to make it complex for the reason later mentioned especially in this case. Of course, a printing layer can be prepared.
[0017] The heat-sealing layer 3 as the aforementioned fracture layer can be first welded to the aforementioned base material 2. It has compatibility in **, and it has the property homogenized to ** in a junction interface, the bond strength in a junction interface becomes very large, and weld means that the heat-sealing layer 3 (fracture layer) is firmly supported by the base material 2 here. Next, you have to fracture comparatively easily with internal pressure. as such synthetic resin -- a low density polyethylene and a line -- there are a low density polyethylene, an ethylene vinylacetate copolymer, polypropylene, an ethylene-acrylic-acid copolymer, an ionomer, etc., and thickness is 5 micrometers - about 30 micrometers Of course, since damaging by the shock at the time of the handling by circulation process etc. must avoid, 5 micrometers or more of fracture by internal pressure elevation will become difficult, if it is required and 30 micrometers is exceeded. Although such a heat-sealing layer 3 is formed by the usual roll coat, the knockout coat, the heat lamination, etc., the resin layer which can be welded to an opposed face with the heat-sealing layer 3 of a base material 2 is required for it. As such a resin, the same resin as the aforementioned heat-sealing layer 3 is chosen. You may not be the same resin as long as weld is possible, of course.
[0018] By the way, in order to raise the sealing performance of packing objects, such as a container and a bag, it will be necessary to enlarge seal intensity of a lid and a container flange. For that purpose, you have to secure the thickness of a heat-sealing layer above to some extent. weakening breaking strength on the other hand, in order to open internal pressure easily -- that is, it is necessary to make a heat-sealing layer thin as much as possible Thus, obtaining required seal intensity and moderate fracture strength is a concept which carries out phase conflict. Then, as shown in drawing 3 , the inside resin layer 31 of the aforementioned heat-sealing layer 3 is formed in the inside of a base material 2 through adhesives for dry laminations like 2 liquid hardening type urethane system resin, or the anchor-coat layer 21, and the internal pressure opening mouth 4 is formed in it at this layered product. And the outside fracture layer 32 is formed in this inside resin layer 31. layers 31 and 32 -- a low density polyethylene and a line -- a low density polyethylene, an ethylene vinylacetate

copolymer, polypropylene, an ethylene-acrylic-acid copolymer, an ionomer, etc. may be used, and you may not be the same resin as long as weld with ** is possible If it is [the thickness of the inside resin layer 31] sufficient if the outside fracture layer 32 can be held to a base material 2 by sufficient bond strength, and there are 5 micrometers - 40 micrometers, it is enough. Moreover, the thickness of the outside fracture layer 32 is about 5-30 micrometers as mentioned above. In addition, the laminating of the inside resin layer 31 is carried out to a base material 2 with other adhesives, and also, of course, a direct laminating may be carried out.

[0019] Thus, while sufficient thickness is securable by making the heat-sealing layer 3 two-layer [of the inside resin layer 31 and the outside fracture layer 32], since the internal pressure opening mouth 4 has reached to the thin fracture layer 32 and is welding the fracture layer 32 to the inside resin layer 31, it fractures the fracture layer 32 easily by internal pressure elevation. That is, it becomes possible by making the heat-sealing layer 3 into two-layer structure, and choosing suitably the thickness of the inside resin layer 31 and the outside fracture layer 32 to control seal intensity and breaking strength with sufficient balance.

[0020] An example is given to below.

[0021]

[Example 1] The coat of the 2 liquid reaction type urethane system anchor coat (Takeda Chemical Industries bamboo rack A3210) was carried out to 12-micrometer polyester film (Toyobo make E5101) as heat-resistant plastic film, and on it, 30-micrometer extrusion coat of the low density polyethylene (Sumitomo Chemical SUMIKASEN L-705) was carried out, and it formed with the long sheet. After aging this in 40-degree C atmosphere for 24 hours, by the rotary knife, it cut endlessly at intervals of about 50mm, the eye was put in, and 8-10-micrometer extrusion coat of the polyethylene still more of the same kind was carried out. The frozen steamed meat dumpling which put on the tray made from polypropylene was wrapped in this packing material at the saccate, and it heated with the microwave oven of 500W. The packing object swelled in about 50 seconds, the steam fell out from the place of an end eye, and it did not result in rupture.

[0022] In addition, the configuration of an end eye was made into "-", "+", and "x", and prepared about each three kinds whose lengths of one side are 3mm, 5mm, and 10mm.

[0023]

[Example 2] The same packing material as an example 1 was prepared, and 200g water was enclosed with **** of the method seal with a size [of 150x180mm], and a seal width of 10mm of four. Three sorts of bags which prepared the end eye (only a base material is penetrated) of the shape of "- (a length of 3mm, 5mm, and 10mm)" in the center of a longitudinal direction of **** were prepared. When carrying out natural fall of these on the 10 times concrete floor from the part with a height of 1m, there was no water leak from any bag.

[0024] When these bags were put on the pan made from earthenware and having been heated with the microwave oven of 500W, it cut in about 60 seconds and the steam blew off from the place of an eye.

[0025]

[Example 3] as heat-resistant plastic film -- a 15 micrometers biaxial extension nylon film (Unitika ONS) and a 30-micrometer line -- the lamination long picture sheet was formed for the low-density-polyethylene film (Rix L6102, Toyobo) with 2 liquid reaction type urethane system dry lamination adhesives the rotary knife after aging this in 40-degree C atmosphere for 48 hours -- about 50mm interval -- endless -- a break -- putting in -- further -- a line -- a low-density-polyethylene film plane -- a 15-micrometer line -- the coat of the low density polyethylene (ULTZEX 1500made from Mitsui petrochemistry C) was extruded and carried out The frozen steamed meat dumpling which put on the tray made from polypropylene was wrapped in this packing material at the saccate, and it heated with the microwave oven of 500W. The packing object swelled in about 60 seconds, the steam fell out from the place of a break, and it did not result in rupture.

[0026] In addition, the configuration of a break was made into "-" and the length prepared two kinds, 5mm and 10mm.

[0027]

[Example 4] 25 micrometers polyester film (Toyobo make E5101) and the 40-micrometer low-density-polyethylene film (product S-203 made from eye cello chemistry) were formed in the lamination long picture sheet with 2 liquid reaction type urethane system adhesives (Takeda Chemical Industries bamboo rack A-310). After aging this, the break of "-" was put in with a die cut roll, and on it, 15-micrometer knockout coat of the low density polyethylene (Sumitomo Chemical SUMIKASEN L-705) was carried out, and it considered as lid material. The break was deeply cut so that it might enter side by side by three pieces and the 50mm pitch by length of 15mm.

[0028] A polyethylene container (the product made from the Idemitsu petrochemistry, magic top) is covered with absorbent cotton, 50g of water was infiltrated, the seal was carried out and the seal of the aforementioned lid material was carried out so that a break might be located in a line in the center. The container was heated with the microwave oven of 500W for home use for 2 minutes. A steam continued rising [lid material] and emitting a steam with ejection and the swelling from the place of a break continuously in about 1 minute after heating.

[0029]

[Effect of the Invention] By according to this invention, preparing the fracture layer with comparatively weak breaking

strength of specific thickness in a heat-sealing layer, welding this to a part of base material or heat-sealing layer as mentioned above, and preparing the internal pressure opening mouth which reaches this fracture layer Internal pressure opening at the time of heating by the microwave oven etc. is attained, and pyro packing etc. is attained large cost reduction is not only made, but, and the temperature or the pressure of internal pressure release can be controlled easily simultaneously with sealing performance.

[Translation done.]

* NOTICES *

TECHNICAL FIELD

[Field of the Invention] When this invention heats a packing object with a microwave oven etc., it relates to the packing material which enabled it to open internal pressure automatically.

[Translation done.]

PRIOR ART

[Description of the Prior Art] If freezing / refrigeration food etc. is heated with a microwave oven still in the state in the state where seal packing was carried out, the moisture contained in food will become a steam, internal pressure will go abruptly up, and ******** will explode at last. Therefore, food is picked out from a packing object and it removes to another heat-resistant container, and it wraps in a wrap film, or the lid is put and heated. This is time-consuming operation which lacks in convenience.

[0003] Then, a packing object is formed with a heat-resistant film or a sheet, and how to cut a packing object with scissors etc. and to prepare opening at the time of heating is considered. However, this not only also requires time and effort, but there may be no convenience like scissors close by. On the other hand, opening some packing objects wide beforehand in a manufacture stage is performed, and the contents which sealing performance is spoiled and are packed will also be limited. Therefore, there is a method of closing with the label the internal pressure opening mouth prepared beforehand, exfoliating a label in the case of heating, and opening the open mouth wide. However, this also has the problem which the excessive process closed with a label joins.

[0004] Therefore, the superposition tape which prepares the weak portion of a bond strength in the heat seal section of a packing object, or a bond strength is weak and tends to divide into two is inserted, and when internal pressure increases by heating, there are some which the weak portion of a bond strength exfoliates automatically, and opening is formed, and opened internal pressure. However, since the weak portion of a bond strength is in the heat-sealing section even if partial, strong sealing performance cannot be expected by homogeneity, but a pouch like a bag body is formed further beforehand, and it is necessary to take the process which fills this up with contents, and is not fit for packing and pyro packing which performs restoration continuously simultaneously. And the method of inserting a tape has the problem which becomes structurally complicated and leads to the increase of cost.

[0005] In addition, what carried out the laminating of the low melting point resin film to the base material which prepared the air hole as heat seal material, considered as lid material, and carried out the heat seal of this to the container is known. It will liquefy, if a low melting point resin film reaches the melting point by heating, and it is pushed up to an air hole portion by internal pressure, and the penetrated air hole is formed. However, when a low melting point film fuses, seal intensity becomes weak and there is a problem that sealing performance is spoiled. Moreover, since it is located in the innermost layer which touches contents directly, when it flies, a low melting point film will be attached, and it adheres to contents or it also has a possibility that the additive of a low melting point film may melt and the scent and taste of broth contents may be spoiled.

[0006] moreover, the above -- also in which internal pressure opening method, there is a problem that control of the heating temperature at the time of internal pressure opening is very difficult

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[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, the internal pressure opening mouth which prepares the fracture layer with comparatively weak breaking strength of specific thickness in a heat-sealing layer, welds this to a part of base material or heat-sealing layer as mentioned above, and reaches this fracture layer is prepared, Internal pressure opening at the time of heating by the microwave oven etc. is attained, and pyro packing etc. is attained large cost reduction is not only made, but, and the temperature or the pressure of internal pressure release can be controlled easily simultaneously with sealing performance.

[Translation done.]

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Then, the technical problem of this invention can be heated with a microwave oven, with food packed, and has neither a burst nor scattering of contents, and the temperature control of internal pressure opening can also be easy, contents can be packed airtightly completely without a non-seal portion, it can respond to any packing form of pyro packing or pouch packing, and productivity is offering a high packing material cheap also in cost.

[Translation done.]

MEANS

[Means for Solving the Problem] In the packing material to which this invention carried out the laminating of the heat-sealing layer to the heat-resistant base material in order to solve the above-mentioned technical problem It is characterized by for the end having been wide opened by the superficies of the aforementioned base material, having prepared the internal pressure opening mouth with which the other end reaches the aforementioned heat-sealing layer at least, and a weld interface preparing mostly the fracture layer which consists of thermoplastic synthetic resin with the comparatively weak breaking strength whose thickness to superficies is 5 micrometers - 30 micrometers in accordance with the other end of this internal pressure opening mouth in the aforementioned heat-sealing layer.

[0009] It can consist of the inside resin layer by which the aforementioned heat-sealing layer was welded to an outside fracture layer and this, and the aforementioned internal pressure opening mouth can be made to penetrate from the aforementioned base material to an inside resin layer.

[0010] the aforementioned outside fracture layer -- a low density polyethylene and a line -- it is desirable to form by a low density polyethylene, an ethylene vinylacetate copolymer, polypropylene, an ethylene-acrylic-acid copolymer, or the ionomers

[0011] Moreover, as for the aforementioned inside resin layer, it is desirable to form by thermoplastic synthetic resin homogeneous as an outside fracture layer.

[0012] The aforementioned internal pressure opening mouth consists of an end eye or a stoma.

[Translation done.]

OPERATION

[Function] The aforementioned fracture layer consists of a resin layer with comparatively weak breaking strength, and except the portion of an internal pressure opening mouth, since it is welding to a part of base material or heat-sealing layer, a weak point portion, a part for i.e., the fracture layer corresponding to an internal pressure opening mouth, fractures it by internal pressure elevation.
[0014]
[The gestalt of operation] Hereafter, the operation gestalt of this invention is explained based on an accompanying drawing.

[0015] Drawing 1 shows the example from which the heat-sealing layer itself is a fracture layer. Like illustration, a packing material 1 consists of the heat-resistant base material 2 and the heat-sealing layer 3, and the internal pressure opening mouth 4 which penetrates a base material 2 is formed in the base material 2. The end eyes 4b, 4c, and 4d of the shape of "+" besides end eye 4a of linear "[-]" configuration as shown in drawing 2 , "x", and a "U" typeface are sufficient as the internal pressure opening mouth 4, or stoma 4e is sufficient as it. The configuration of stoma 4e may not be restricted circularly [illustration], but the anomaly of a polygon and others is sufficient as it. Although especially a limit does not have the size of an end eye or a stoma, it is about 2-5mm in the major axis of about 1-15mm and a stoma by the length of an end eye. Of course, you may prepare more than one.
[0016] As the aforementioned base material 2 with thermal resistance, a synthetic-resin film with thermal resistance is common, in order to use with a microwave oven, especially, high thermal resistance is not required but a simple substance or complex, such as biaxial extension polypropylene, 1 shaft extension high density polyethylene, biaxial extension polyester, and a biaxial extension polyamide, are used. In addition, paper and a metallic foil may be used and it will be necessary to make it complex for the reason later mentioned especially in this case. Of course, a printing layer can be prepared.
[0017] The heat-sealing layer 3 as the aforementioned fracture layer can be first welded to the aforementioned base material 2. It has compatibility in **, and it has the property homogenized to ** in a junction interface, the bond strength in a junction interface becomes very large, and weld means that the heat-sealing layer 3 (fracture layer) is firmly supported by the base material 2 here. Next, you have to fracture comparatively easily with internal pressure. as such synthetic resin -- a low density polyethylene and a line -- there are a low density polyethylene, an ethylene vinylacetate copolymer, polypropylene, an ethylene-acrylic-acid copolymer, an ionomer, etc., and thickness is 5 micrometers - about 30 micrometers Of course, since damaging by the shock at the time of the handling by circulation process etc. must avoid, 5 micrometers or more of fracture by internal pressure elevation will become difficult, if it is required and 30 micrometers is exceeded. Although such a heat-sealing layer 3 is formed by the usual roll coat, the knockout coat, the heat lamination, etc., the resin layer which can be welded to an opposed face with the heat-sealing layer 3 of a base material 2 is required for it. As such a resin, the same resin as the aforementioned heat-sealing layer 3 is chosen. You may not be the same resin as long as weld is possible, of course.
[0018] By the way, in order to raise the sealing performance of packing objects, such as a container and a bag, it will be necessary to enlarge seal intensity of a lid and a container flange. For that purpose, you have to secure the thickness of a heat-sealing layer above to some extent. weakening breaking strength on the other hand, in order to open internal pressure easily -- that is, it is necessary to make a heat-sealing layer thin as much as possible Thus, obtaining required seal intensity and moderate fracture strength is a concept which carries out phase conflict. Then, as shown in drawing 3 , the inside resin layer 31 of the aforementioned heat-sealing layer 3 is formed in the inside of a base material 2 through adhesives for dry laminations like 2 liquid hardening type urethane system resin, or the anchor-coat layer 21, and the internal pressure opening mouth 4 is formed in it at this layered product. And the outside fracture layer 32 is formed in this inside resin layer 31. layers 31 and 32 -- a low density polyethylene and a line -- a low density polyethylene, an ethylene vinylacetate copolymer, polypropylene, an ethylene-acrylic-acid copolymer, an ionomer, etc. may be used, and you may not be the same resin as long as weld with ** is possible If it is [the thickness of the inside resin layer 31] sufficient if the outside fracture

layer 32 can be held to a base material 2 by sufficient bond strength, and there are 5 micrometers - 40 micrometers, it is enough. Moreover, the thickness of the outside fracture layer 32 is about 5-30 micrometers as mentioned above. In addition, the laminating of the inside resin layer 31 is carried out to a base material 2 with other adhesives, and also, of course, a direct laminating may be carried out.

[0019] Thus, while sufficient thickness is securable by making the heat-sealing layer 3 two-layer [of the inside resin layer 31 and the outside fracture layer 32], since the internal pressure opening mouth 4 has reached to the thin fracture layer 32 and is welding the fracture layer 32 to the inside resin layer 31, it fractures the fracture layer 32 easily by internal pressure elevation. That is, it becomes possible by making the heat-sealing layer 3 into two-layer structure, and choosing suitably the thickness of the inside resin layer 31 and the outside fracture layer 32 to control seal intensity and breaking strength with sufficient balance.

[0020] An example is given to below.

[0021]

[Example 1] The coat of the 2 liquid reaction type urethane system anchor coat (Takeda Chemical Industries bamboo rack A3210) was carried out to 12-micrometer polyester film (Toyobo make E5101) as heat-resistant plastic film, and on it, 30-micrometer extrusion coat of the low density polyethylene (Sumitomo Chemical SUMIKASEN L-705) was carried out, and it formed with the long sheet. After aging this in 40-degree C atmosphere for 24 hours, by the rotary knife, it cut endlessly at intervals of about 50mm, the eye was put in, and 8-10-micrometer extrusion coat of the polyethylene still more of the same kind was carried out. The frozen steamed meat dumpling which put on the tray made from polypropylene was wrapped in this packing material at the saccate, and it heated with the microwave oven of 500W. The packing object swelled in about 50 seconds, the steam fell out from the place of an end eye, and it did not result in rupture.

[0022] In addition, the configuration of an end eye was made into "-", "+", and "x", and prepared about each three kinds whose lengths of one side are 3mm, 5mm, and 10mm.

[0023]

[Example 2] The same packing material as an example 1 was prepared, and 200g water was enclosed with **** of the method seal with a size [of 150x180mm], and a seal width of 10mm of four. Three sorts of bags which prepared the end eye (only a base material is penetrated) of the shape of "- (a length of 3mm, 5mm, and 10mm)" in the center of a longitudinal direction of **** were prepared. When carrying out natural fall of these on the 10 times concrete floor from the part with a height of 1m, there was no water leak from any bag.

[0024] When these bags were put on the pan made from earthenware and having been heated with the microwave oven of 500W, it cut in about 60 seconds and the steam blew off from the place of an eye.

[0025]

[Example 3] as heat-resistant plastic film -- a 15 micrometers biaxial extension nylon film (Unitika ONS) and a 30-micrometer line -- the lamination long picture sheet was formed for the low-density-polyethylene film (Rix L6102, Toyobo) with 2 liquid reaction type urethane system dry lamination adhesives the rotary knife after aging this in 40-degree C atmosphere for 48 hours -- about 50mm interval -- endless -- a break -- putting in -- further -- a line -- a low-density-polyethylene film plane -- a 15-micrometer line -- the coat of the low density polyethylene (ULTZEX 1500made from Mitsui petrochemistry C) was extruded and carried out The frozen steamed meat dumpling which put on the tray made from polypropylene was wrapped in this packing material at the saccate, and it heated with the microwave oven of 500W. The packing object swelled in about 60 seconds, the steam fell out from the place of a break, and it did not result in rupture.

[0026] In addition, the configuration of a break was made into "-" and the length prepared two kinds, 5mm and 10mm.

[0027]

[Example 4] 25 micrometers polyester film (Toyobo make E5101) and the 40-micrometer low-density-polyethylene film (product S-203 made from eye cello chemistry) were formed in the lamination long picture sheet with 2 liquid reaction type urethane system adhesives (Takeda Chemical Industries bamboo rack A-310). After aging this, the break of "-" was put in with a die cut roll, and on it, 15-micrometer knockout coat of the low density polyethylene (Sumitomo Chemical SUMIKASEN L-705) was carried out, and it considered as lid material. The break was deeply cut so that it might enter side by side by three pieces and the 50mm pitch by length of 15mm.

[0028] A polyethylene container (the product made from the Idemitsu petrochemistry, magic top) is covered with absorbent cotton, 50g of water was infiltrated, the seal was carried out and the seal of the aforementioned lid material was carried out so that a break might be located in a line in the center. The container was heated with the microwave oven of 500W for home use for 2 minutes. A steam continued rising [lid material] and emitting a steam with ejection and the swelling from the place of a break continuously in about 1 minute after heating.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The cross section showing an example of the packing material of this invention
[Drawing 2] The plan showing the configuration of an internal pressure opening mouth same as the above
[Drawing 3] The cross section showing other examples of a packing material
[Description of Notations]
1 Packing Material
2 Heat-resistant Base Material
3 Heat-Sealing Layer
4 Internal Pressure Opening Mouth
4a, 4b, 4c, 4d End eye
4e Stoma
21 Anchor-Coat Layer
31 Inside Resin Layer
32 Outside Fracture Layer

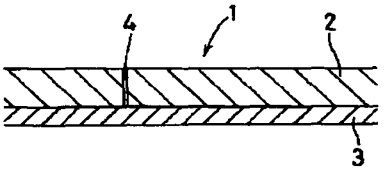
[Translation done.]

* NOTICES *

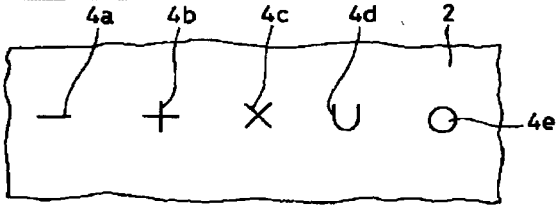
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

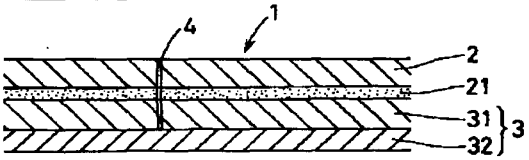
[Drawing 1]



[Drawing 2]



[Drawing 3]



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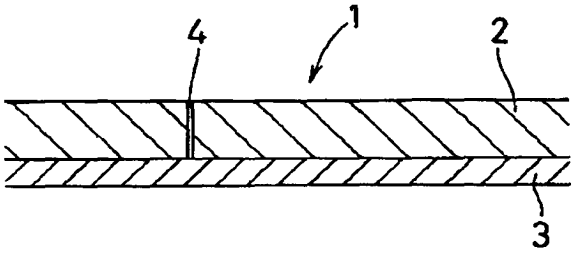
最終頁に続く

(54)【発明の名称】　内圧開放可能な包装材

(57)【要約】

【課題】　内容物を完全に気密に包装することができ、生産性が高くコスト的に安価な内圧開放可能な包装材を提供することである。

【解決手段】　耐熱性基材２にヒートシール層３を融着し、耐熱性基材２のみを貫通する内圧開放口４を設けたのである。前記ヒートシール層３は、比較的破裂強度の弱い樹脂層から成り、内圧開放口４以外は基材２に融着しているため、弱点部分即ち内圧開放口４に対応する部分が内圧上昇によって破断する。



【特許請求の範囲】
【請求項１】　耐熱性基材にヒートシール層を積層した包装材において、一端が前記基材の外面に開放され、他端が少くとも前記ヒートシール層に達する内圧開放口を設け、この内圧開放口の他端に融着界面がほぼ一致し、かつ外面までの厚みが５～３０μｍの破断層を前記ヒートシール層に設けたことを特徴とする内圧開放可能な包装材。
【請求項２】　前記ヒートシール層が外面の破断層とこれに融着された内面樹脂層の２層から成り、前記内圧開放口が前記基材からほぼ外面破断層まで達していることを特徴とする請求項１に記載された内圧開放可能な包装材。
【請求項３】　前記破断層が、低密度ポリエチレン、線状低密度ポリエチレン、エチレン－酢酸ビニル共重合体、ポリプロピレン、エチレン－アクリル酸共重合体、アイオノマーのうちのいずれかより成る請求項１又は２に記載の内圧開放可能な包装材。
【請求項４】　前記内面樹脂層が、低密度ポリエチレン、線状低密度ポリエチレン、エチレン－酢酸ビニル共重合体、ポリプロピレン、エチレン－アクリル酸共重合体、アイオノマーのうちのいずれかである請求項１又は２に記載の内圧開放可能な包装材。
【請求項５】　前記内圧開放口が切り目又は小孔から成る請求項１～４のいずれかに記載の内圧開放可能な包装材。
【発明の詳細な説明】
【０００１】
【発明の技術分野】この発明は、電子レンジ等で包装体を加熱した際に自動的に内圧を開放できるようにした包装材に関する。
【０００２】
【従来の技術】冷凍・冷蔵食品などを密封包装した状態のままで電子レンジによって加熱すると、食品に含まれる水分が蒸気となって内圧が急上昇し、遂には包装体が破裂してしまう。そのため、食品を包装体から取り出して別の耐熱容器に移しかえラップフィルムで包んだり、蓋を被せて加熱している。これは便利性に欠ける手間のかかる操作である。
【０００３】そこで包装体を耐熱性フィルムやシートで形成し、加熱時にハサミ等で包装体を切断して開口を設ける方法が考えられている。しかしこれも手間がかかるばかりでなく、手近にハサミのような利器がない場合もある。一方、製造段階で予め包装体の一部を開放しておくことも行なわれているが、密封性が損われ、また包装する内容物も限定されてしまう。そのため、予め設けられた内圧開放口をラベルで封止しておき、加熱の際にラベルを剥離して開放口を開放しておく方法がある。しかし、これもラベルで封止する余分な工程が加わる問題がある。
【０００４】そのため、包装体の熱封緘部に接着強度の弱い部分を設けておくか、或は接着強度が弱くて二つに分離し易い重ね合せテープを挿入しておき、加熱によって内圧が高まったとき自動的に接着強度の弱い部分が剥離して開口が形成され内圧を開放するようにしたものがある。しかしながら、部分的であってもヒートシール部に接着強度の弱い部分があるため均一で強い密封性は期待できず、さらに予め袋体のようなパウチを形成しておいて、これに内容物を充填する工程を採る必要があり、包装と充填を同時に連続して行なうピロー包装には向いていない。しかもテープを挿入する方法は構造的に複雑となりコスト増につながる問題がある。
【０００５】その他、通気孔を設けた基材に、熱封緘材として低融点樹脂フィルムを積層して蓋材とし、これを容器に熱封緘したものも知られている。加熱により低融点樹脂フィルムが融点に達すると液化し内圧によって通気孔部分に押し上げられ、貫通した通気孔が形成されるようにしたものである。しかしながら、低融点フィルムが溶融すると封緘強度が弱くなり密封性が損なわれるという問題がある。また、低融点フィルムは内容物に直接触れる最内層に位置するので、この層が溶融するとべとついた状態になり内容物に付着したり、低融点フィルムの添加物が溶けだし内容物の香りや味が損なわれる恐れもある。
【０００６】また、上記いずれの内圧開放方法においても、内圧開放時の加熱温度の制御が非常に難しい問題がある。
【０００７】
【発明の課題】そこで、この発明の課題は、食品を包装したまま電子レンジで加熱することができ破裂や内容物の飛散がなく、かつ内圧開放の温度制御も簡単で、内容物を未シール部分なしに完全に気密に包装することができ、ピロー包装やパウチ包装のいずれの包装形態にも対応することができ、生産性が高くコスト的にも安価な包装材を提供することである。
【０００８】
【課題の解決手段】上記の課題を解決するために、この発明は、耐熱性基材にヒートシール層を積層した包装材において、一端が前記基材の外面に開放され、他端が少くとも前記ヒートシール層に達する内圧開放口を設け、この内圧開放口の他端に融着界面がほぼ一致し、かつ外面までの厚みが５μｍ～３０μｍの破断強度が比較的弱い熱可塑性合成樹脂から成る破断層を前記ヒートシール層に設けたことを特徴とする。
【０００９】前記ヒートシール層が外面破断層とこれに融着された内面樹脂層より成り、前記内圧開放口を前記基材から内面樹脂層まで貫通させておくことができる。
【００１０】前記外面破断層を、低密度ポリエチレン、線状低密度ポリエチレン、エチレン－酢酸ビニル共重合体、ポリプロピレン、エチレン－アクリル酸共重合体、

アイオノマーのうちのいずれかによって形成するのが好ましい。

【００１１】また、前記内面樹脂層は、外面破断層と同質の熱可塑性合成樹脂によって形成するのが好ましい。

【００１２】前記内圧開放口は、切り目や小孔から成る。

【００１３】

【作用】前記破断層は比較的破断強度の弱い樹脂層より成り、内圧開放口の部分以外は基材、又はヒートシール層の一部に融着しているため、弱点部分即ち内圧開放口に対応する破断層部分が内圧上昇によって破断する。

【００１４】

【実施の形態】以下、この発明の実施形態を添付図面に基づいて説明する。

【００１５】図１はヒートシール層自体が破断層になっている例を示す。図示のように、包装材１は、耐熱性基材２とヒートシール層３から成り、基材２には、基材２を貫通する内圧開放口４が設けられている。内圧開放口４は、図２に示すような直線的な「－」形状の切り目４ａのほか、「＋」、「×」、「Ｕ」字形状の切り目４ｂ、４ｃ、４ｄでもよく、或は小孔４ｅでもよい。小孔４ｅの形状は、図示の円形に限らず、多角形その他の異形でもよい。切り目又は小孔の大きさは特に制限はないが、切り目の長さで１～１５ｍｍ程度、小孔の長径で２～５ｍｍ程度である。勿論、複数設けてもよい。

【００１６】前記耐熱性のある基材２としては、耐熱性のある合成樹脂フィルムが一般的であり、電子レンジで用いるためには特に高い耐熱性を要せず、２軸延伸ポリプロピレン、１軸延伸高密度ポリエチレン、２軸延伸ポリエステル、２軸延伸ポリアミド等の単体又は複合体が用いられる。そのほか、紙や金属箔を用いてもよく、この場合は特に後述する理由によって複合体にする必要が生じる。勿論、印刷層を設けることができる。

【００１７】前記破断層としてのヒートシール層３は、まず、前記基材２に対して融着しうるものでなければならない。ここで融着とは、互に相溶性を有し、接合界面において互に均質化する特性を有し、接合界面における接着強度が非常に大きくなり、ヒートシール層３（破断層）が基材２に強固に支持されることを意味する。次に、内圧によって比較的容易に破断するものでなければならない。このような合成樹脂としては、低密度ポリエチレン、線状低密度ポリエチレン、エチレン－酢酸ビニル共重合体、ポリプロピレン、エチレン－アクリル酸共重合体、アイオノマー等があり、厚さは５μｍ～３０μｍ程度である。勿論、流通過程等での取り扱い時の衝撃によって破損することは避けなければならないから５μｍ以上は必要であり、３０μｍを越えると内圧上昇による破断が困難になる。このようなヒートシール層３は、通常のロールコート、押し出しコート、ヒートラミネーション等によって形成されるが、基材２のヒートシール層３との対向面に融着可能な樹脂層が必要である。そのような樹脂としては、前記ヒートシール層３と同様の樹脂が選択される。勿論融着可能であれば、同一の樹脂でなくてもよい。

【００１８】ところで、容器や袋などの包装体の密封性を高めるためには、例えば蓋と容器フランジとのシール強度を大きくする必要が生じる。そのためには、ヒートシール層の厚みをある程度以上確保しなければならない。一方、内圧を容易に開放するためには、破断強度を弱くすること、即ちできるだけヒートシール層を薄くする必要がある。このように、必要なシール強度と適度の破断強さを得ることは相矛盾する概念である。そこで、図３に示すように、基材２の内面に、２液硬化型ウレタン系樹脂のようなドライラミネーション用接着剤又はアンカーコート層２１を介して前記ヒートシール層３の内面樹脂層３１を設け、この積層体に内圧開放口４を設けておく。そして、この内面樹脂層３１に外面破断層３２を設ける。層３１、３２は低密度ポリエチレン、線状低密度ポリエチレン、エチレン－酢酸ビニル共重合体、ポリプロピレン、エチレン－アクリル酸共重合体、アイオノマー等が用いられ、互に融着可能であれば同一の樹脂でなくてもよい。内面樹脂層３１の厚みは、外面破断層３２を充分な接着強度で基材２に対して保持できれば足り、５μｍ～４０μｍあれば充分である。また、外面破断層３２の厚みは、前述のように５～３０μｍ程度である。なお、基材２と内面樹脂層３１を他の接着剤で積層するほか、直接積層してもよいことは勿論である。

【００１９】このように、ヒートシール層３を内面樹脂層３１と外面破断層３２の２層とすることにより、充分な厚みを確保することができる一方、内圧開放口４は、薄い破断層３２まで達しており、かつ破断層３２は内面樹脂層３１に融着しているため、内圧上昇によって破断層３２は容易に破断する。即ち、ヒートシール層３を２層構造にして内面樹脂層３１と外面破断層３２の厚みを適当に選択することにより、シール強度と破断強度をバランス良く制御することが可能となる。

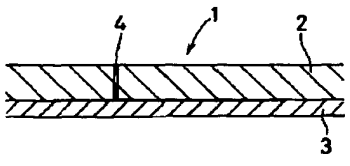
【００２０】以下に実施例を挙げる。

【００２１】

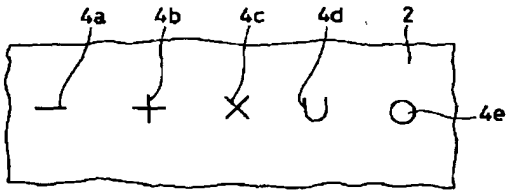
【実施例１】耐熱プラスチックフィルムとして１２μｍポリエステルフィルム（東洋紡績製Ｅ５１０１）に２液反応タイプのウレタン系アンカーコート（武田薬品工業製タケラックＡ３２１０）をコートし、その上に低密度ポリエチレン（住友化学工業製スミカセンＬ－７０５）を３０μｍ押出しコートして長尺シートで形成した。これを４０℃の雰囲気で２４時間エージングした後、回転刃によって約５０ｍｍ間隔でエンドレスに切り目をいれ、更に同種のポリエチレンを８～１０μｍ押出しコートした。この包装材でポリプロピレン製トレーに乗せた冷凍シュウマイを袋状に包み、５００Ｗの電子レンジで加熱した。約５０秒で包装体が膨らみ切り目の所から蒸

気が抜け、破裂に至らなかった。
【００２２】なお、切り目の形状は、「－」、「＋」、「×」とし、それぞれについて、一辺の長さが３ｍｍ、５ｍｍ、１０ｍｍの３種類を用意した。
【００２３】
【実施例２】実施例１と同じ包装材を用意し、サイズ１５０×１８０ｍｍ、シール巾１０ｍｍの４方シールの平袋に２００ｇの水を封入した。平袋の長手方向中央に、長さ３ｍｍ、５ｍｍ、１０ｍｍの「－」状の切り目（基材のみを貫通する）を設けた３種の袋を用意した。これらを高さ１ｍの個所から１０回コンクリート床上に自然落下させたところ、いずれの袋からも水もれはなかった。
【００２４】これらの袋を陶器製の皿に載せ５００Ｗの電子レンジで加熱したところ、約６０秒で切り目の所から蒸気が噴出した。
【００２５】
【実施例３】耐熱プラスチックフィルムとして１５μｍの２軸延伸ナイロンフィルム（ユニチカ製ＯＮＳ）と３０μｍの線状低密度ポリエチレンフィルム（東洋紡績製リックスＬ６１０２）を２液反応タイプのウレタン系ドライラミネーション接着剤で貼合せ長尺シートを形成した。これを４０℃の雰囲気中で４８時間エージングした後、回転刃によって約５０ｍｍ間隔でエンドレスに切れ目を入れ、更に線状低密度ポリエチレンフィルム面へ１５μｍの線状低密度ポリエチレン（三井石油化学製ウルトゼックス１５００Ｃ）を押出しコートした。この包装材でポリプロピレン製トレーに乗せた冷凍シューマイを袋状に包み、５００Ｗの電子レンジで加熱した。約６０秒で包装体が膨らみ切れ目の所から蒸気が抜け、破裂に至らなかった。
【００２６】なお、切れ目の形状は「－」とし、その長さは５ｍｍ、１０ｍｍの２種類を用意した。
【００２７】
【実施例４】２５μｍのポリエステルフィルム（東洋紡績製Ｅ５１０１）と４０μｍの低密度ポリエチレンフィルム（アイセロ化学製Ｓ－２０３）とを２液反応タイプのウレタン系接着剤（武田薬品工業タケラックＡ－３１０）で貼合せ長尺シートに形成した。これをエージングした後、ダイカットロールで「－」の切れ目を入れ、その上に低密度ポリエチレン（住友化学工業製スミカセンＬ－７０５）を１５μｍ押し出しコートして蓋材とした。切れ目は長さ１５ｍｍで３ケ、５０ｍｍのピッチで並んで入るように切り込んだ。
【００２８】ポリエチレン容器（出光石油化学製、マジックトップ）に脱脂綿を敷き水５０ｇを含浸させ前記蓋材を切れ目が中央に並ぶようにシールして封緘した。その容器を家庭用の５００Ｗの電子レンジで２分加熱した。加熱後約１分で蓋材が盛り上り、つづいて切れ目のところから蒸気が抜け出し、膨らみながら蒸気を放出し続けた。
【００２９】
【発明の効果】この発明によれば、以上のように、特定厚みの比較的破断強度が弱い破断層をヒートシール層に設け、これを基材又はヒートシール層の一部に融着し、この破断層に達する内圧開放口を設けることによって、電子レンジ等による加熱時の内圧開放が可能となり、大巾なコスト削減ができるばかりでなく、ピロー包装等も可能となり、また密封性と同時に内圧解放の温度又は圧力を容易に制御することができる。
【図面の簡単な説明】
【図１】この発明の包装材の一例を示す断面図
【図２】同上の内圧開放口の形状を示す平面図
【図３】包装材の他の例を示す断面図
【符号の説明】
１　包装材
２　耐熱性基材
３　ヒートシール層
４　内圧開放口
４ａ、４ｂ、４ｃ、４ｄ　切り目
４ｅ　小孔
２１　アンカーコート層
３１　内面樹脂層
３２　外面破断層

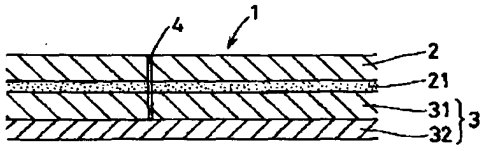
【図１】



【図２】



【図３】



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